



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Frank J. Fabin	Examiner:	Weiss Jr., Joseph Francis
Serial No.:	09/765,224	Group Art Unit:	3761
Filed:	January 18, 2001	Confirmation No.:	7388
Docket No.:	56115US002		
Title:	MODULAR RESPIRATORS AND A METHOD OF CONVERSION THEREOF		

**BRIEF ON APPEAL**

MS: Appeal Brief - Patents  
Commissioner for Patents  
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This is an appeal from the Final Rejection of claims 1 – 41 mailed December 1, 2003. The Notice of Appeal was filed by facsimile on February 4, 2004 and received by the USPTO on February 4, 2004. As provided in MPEP § 1206, the due date for filing this Brief on Appeal is April 5, 2004 (due to April 4, 2004, being a Sunday).

The Brief on Appeal is being filed in triplicate. The appeal fee required under 37 CFR § 1.17(c) and any deficiency or overpayment in fees should be charged to Deposit Account No. 13-3723.

04/08/2004 AMONDAF1 00000018 133723 09765224

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Date April 5, 2004

Signed: William D. Bauer

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## REAL PARTY IN INTEREST

The real party in interest is 3M Innovative Properties Company of St. Paul, Minnesota.

## RELATED APPEALS AND INTERFERENCES

Appellants, Appellant's legal representative and the assignee are not aware of any appeals or interference proceedings before the U.S. Patent and Trademark Office that will directly affect or be directly affected by or have a bearing on the Board's decision in this Appeal.

### **STATUS OF CLAIMS**

Forty-one (41) claims were filed with the application and are still pending. No claims have been added and no claims have been canceled.

Claims 15, 16, 17, 29 and 38 were amended in an Amendment filed December 12, 2002 in response to a first Office Action mailed September 19, 2002.

All forty-one (41) claims currently stand rejected and are pending in this appeal.

A copy of the appealed claims as last amended is reproduced in the Appendix.

### **STATUS OF AMENDMENTS**

All amendments have been entered. There are no outstanding amendments.

## **SUMMARY OF THE INVENTION**

The present invention provides a respirator design that can be configured as a respirator hood, a full-face respirator, or any other similar or equivalent respirators using modular components, particularly an interchangeable face shield component. In one embodiment, a respirator of a first configuration can be converted into a respirator of a second configuration by removing an interchangeable lens component from the first configuration and mounting it to the second configuration. In one embodiment, the interchangeable face shield component is simply a facial lens. In another embodiment, however, the interchangeable face shield component includes a facial lens and a full facepiece seal which is fitted around the lens. In this latter embodiment, the interchangeable face shield component works as a full facepiece respirator itself when connected to proper respiratory means, but can be converted to a hood respirator by superpositioning a hood over the full facepiece respirator.

In addition, the present invention can be field converted between two configurations (e.g., a hood and a full facepiece) without the need for special tools (or any tools). Field conversions could be accomplished through the use of ratcheting or latch mechanisms in conjunction with a band element to provide the connection and seal between the common face shield component and a body seal (such as a full facepiece seal or a hood). In one embodiment, novel mechanical fasteners employing microstructured sealing and retention elements are employed to affix the full-face or hood elements to the lens component.

The ability to transition from a full facepiece respirator to various hood type respirators or vice versa, or from one type of hood respirator to another type of hooded respirator, is a significant feature of this invention. This is accomplished by the use of the specially designed parts that consist of the facepiece, lens frame, lens, hard-hats, suspensions and various hood combinations. In one preferred embodiment, body seals and the common face shield component are coupled via a lens frame tightened around the lens. The lens frame is readily disassembled by a user and either the hood or full facepiece attached thereto. Alternatively, the lens frame has a securing component that allows disassembly and

reassembly without the need for tools or special equipment. This modularity provides the user with the ability to change the respirator to the user's particular needs and to realize both economies and conveniences. In addition, the user can replace worn, soiled or contaminated components as needed and as desired. A further advantage of this invention is that a variety of hoods may be interchanged with other respirator components, from traditional loose fitting types to tight fitting hoods. This gives the user the ability to utilize air delivery from an air compressor via piping and hoses, or from a powered air purifying respirator (PAPR). With a tight fitting hood, positive pressure air can be provided to the user by self contained breathing apparatus (SCBA) or the respirator can be used in the negative pressure mode (where the user inhales air through filters).



## ISSUES ON APPEAL

The issues on appeal are:

1. Does U.S. Patent No. 6,328,031 (Tischer et al) disclose (a) converting a respirator of one type of body seal to a second type of body seal; and (b) a lens having a perimeter sealing edge extending around the lens to render Claims 1 – 11 unpatentable under 35 USC § 103(a)?
2. Does Tischer et al disclose a facial lens having a perimeter sealing edge extending around the lens to render Claims 12 – 28 unpatentable under 35 USC § 103(a)?
3. Does Tischer et al disclose (a) a respiratory kit having a plurality of body seals of at least a first type and a second type; (b) a facial lens having a perimeter sealing edge extending around the lens; and (c) a facial lens interchangeable with and being selectively removably coupled with each body seal to render Claims 29 – 37 unpatentable under 35 USC § 103(a)?
4. Does Tischer et al disclose (a) a respirator mask interchangeable with at least one respirator hood; (b) a facial lens with a perimeter sealing edge around the mask; and (c) a mask capable of being selectively removably coupled with each hood along the perimeter sealing edge of the mask to render Claims 38 – 41 unpatentable under 35 USC § 103(a)?

## GROUPING OF CLAIMS

The claims do not stand or fall together. For purposes of expediting this Appeal and complying with 37 CFR § 1.192(c)(7), and without conceding that any of the claims grouped below should be similarly grouped in any subsequent appeal or patent infringement litigation concerning these claims, the claims could be considered by the Board according to the following Groups:

- I: Claims 1 – 11
- II: Claims 12 – 28
- III: Claims 29 – 37
- IV: Claims 38 – 41

Claims 1 – 11 recite methods of converting a respirator mask from a first type of body seal to another type of body seal. A respirator mask of a first type of body seal, e.g., a respirator hood, can be converted into a respirator mask of a second type of body seal, e.g., a full body respirator suit, by removing an interchangeable lens component from the first body type and mounting it to the second body type.

Claims 12 – 28 recite a hood respirator having a shroud with a head-covering portion which has a lens opening therein and a body sealing portion for forming a seal around a wearer's neck. A facial lens is engageable and disengageable with the lens opening of the shroud via a perimeter sealing edge. Claims 12 – 28 are separately patentable over the claims of Group I because the characteristics of the hood respirator allow the hood respirator to be field converted between two configurations (e.g., a hood and a full facepiece).

Claims 29 – 37 recite a respiratory kit having a plurality of types of body seals, e.g., a respirator and a full body respirator suit, and at least one facial lens interchangeable with the plurality of body seals. Claims 29 – 37 are separately patentable over the claims of Group I and Group II because a kit is provided allowing a user to select the appropriate type of body seal while utilizing a single facial lens.

Claims 38 – 41 recite a respiratory kit having at least one respiratory hood and at least one respirator mask having a facial lens, a full facepiece seal wherein the mask is capable of being selectively and removably coupled with each hood along a perimeter sealing edge of the mask. Claims 38 – 41 are separately patentable over the claims of Group I, Group II and Group III because of ease of superpositioning the hood over the full facepiece seal providing a seal between the hood and the mask.

## ARGUMENTS OF APPELANTS

- 1. Does U.S. Patent No. 6,328,031 (Tischer et al) disclose (a) converting a respirator of one type of body seal to a second type of body seal; and (b) a lens having a perimeter sealing edge extending around the lens to render Claims 1 – 11 unpatentable under 35 USC § 35 USC § 103(a)?**

Tischer et al discloses a firefighting hood and face mask assembly. The hood disclosed by Tischer et al is made of a knitted or woven heat and flame resistant aramid material (column 4, lines 3 – 11). A face mask 26 includes a face plate 54 secured to hood at a plurality of fasteners 62, spaced at intervals along the perimeter of face mask 26 (Figures 3, 12, 13, 17, 21 and 22). Secured at each of these fastening locations to face mask 26 are [face] seal member (for example, 58 in Figures 4 – 11) and hood 24, consisting of inner and outer layers 50, 52. This provides the basic securing structure disclosed in Tischer et al.

Note that neither seal member 58 nor hood 24, 50, 52 are secured to face mask 26 at locations around the perimeter of face mask 26 that are intermediate to fasteners 62. Thus, the locations around the perimeter of face mask 26 that are intermediate to fasteners are not secured to either seal member 58 or hood 24. Consequently, face mask 26 is not sealed with either sealing member 58 or hood 24. Tischer et al is concerned with mechanically securing face mask 26 with sealing member 58 and hood 24 but does not provide a seal.

Also note that the firefighting hood and face mask assembly disclosed in Tischer et al is a complete system. The system disclosed in Tischer et al always includes face mask 26 (or an equivalent), [face] sealing member 58 (or an equivalent) and hood 24 (or an equivalent). Thus, the system disclosed in Tischer et al always has a single configuration, although the exact structure of each element varies according to the various embodiments. At no point does Tischer et al show, disclose or suggest converting face mask 26 for use with different types of body seals nor a kit with interchangeable body seals. Both body seals disclosed in Tischer et al are shown used at all times.

First, independent claims 1 and 11 require a method of converting a respirator mask from a first type of body seal to a second type of body seal (see claim 1, lines 1 and 2) or from a full facepiece respirator to a hood respirator (see claim 11, lines 1 and 2). This is explicit language in the claims. This language is in the preamble and this language does “breathe life into the claims.” It is respectfully submitted that neither Tischer et al nor Corsini (nor Reeves et al with respect to claim 9), either singly or in combination, disclose, show or suggest such a conversion. In contrast, the firefighting hood and face mask assembly disclosed in Tischer et al shows at all times the face mask coupled to both a sealing member and a hood at the same time. Neither does Corsini disclose, show or suggest such a conversion.

Second, independent claims 1 and 11 also require a lens having a perimeter sealing edge extending around the lens (see claims 1 and 11, lines 2 and 3). Sealing is defined in the specification as “at least as effective to prevent contaminant intrusion into the interior of the respirator” (see page 5, line 32, to page 6, line 2). It is respectfully submitted that neither Tischer et al nor Corsini (nor Reeves et al with respect to claim 9) disclose, show or suggest such sealing as explicitly recited in the claims and as interpreted by the specification. It has been noted that Tischer et al discloses a firefighting hood and face mask assembly. The hood disclosed by Tischer et al is made of a knitted or woven heat and flame resistant aramid material (column 4, lines 3 – 11). A face mask 26 includes a face plate 54 secured to hood at a plurality of fasteners 62, spaced at intervals along the perimeter of face mask 26 (Figures 3, 12, 13, 17, 21 and 22). Secured at each of these fastening locations to face mask 26 are [face] seal member (for example, 58 in Figures 4 – 11) and hood 24, consisting of inner and outer layers 50, 52. Even with element 60 (rim), Tischer et al does not provide such sealing. Note that the hood disclosed in Tischer et al only has to operate while coupled to a self-contained breathing apparatus (SCBA). The SCBA always provides a positive (with respect to ambient) pressure within the hood. Since the interior of the hood disclosed in Tischer et al always has a positive pressure, external contaminants can not enter the hood even though the face seal member does not provide a perimeter sealing edge as required by the present claims. In contrast, the presently claimed invention may be used in an environment in which the breathing of the operator induces a negative pressure (with respect to ambient) inside the respirator mask. Thus, the seal of presently claimed invention must be “at least as effective to

prevent contaminant intrusion into the interior of the respirator.” This level of sealing is not taught nor suggested by Tischer et al.

Third, independent claim 1 also requires releasing a seal between the perimeter sealing edge and a lens opening (see claim 1, line 4), removing the lens from the lens opening (see claim 1, line 6), aligning the lens (see claim 1, line 7) and forming a seal (see claim 1, line 8). Similarly, independent claim 11 also requires releasing a seal on the full facepiece respirator from sealed engagement (see claim 11, line 4), removing the lens from the full facepiece respirator (see claim 11, line 6), aligning the lens (see claim 11, line 7) and sealably affixing (see claim 11, line 9). These are all explicit claim elements. It is respectfully submitted that neither Tischer et al nor Corsini (nor Reeves et al with respect to claim 9) disclose, show or suggest such explicitly claimed method steps. Tischer et al does not show or suggest releasing, removing, aligning or sealing. The hood respirator is Tischer et al has a single configuration.

With respect to the presently claimed invention, Corsini only discloses and has only been cited to show a gas delivery conduit. Corsini does not disclose the claimed features highlighted above.

With respect to the presently claimed invention, Reeves et al only discloses and has been cited only to show the use of microstructured surfaces. Reeves et al does not disclose the claimed features highlighted above.

Claims 2 – 10 are dependent upon independent claim 1 and contain all of the above noted limitations of claim 1.

Thus, it is respectfully submitted that the Examiner has failed to establish a prima facie case of obviousness of claims 1 – 11 over Tischer et al in view of Corsini (and in view of Reeves et al with respect to claim 9). The rejection of claims 1 – 11 under 35 USC § 103(a) over Tischer et al in view of Corsini (and Reeves) is improper and should be reversed.

**2. Does Tischer et al disclose a facial lens having a perimeter sealing edge extending around the lens to render Claims 12 – 28 unpatentable under 35 USC § 103(a)?**

As noted above, Tischer et al discloses a firefighting hood and face mask assembly. The hood disclosed by Tischer et al is made of a knitted or woven heat and flame resistant aramid material (column 4, lines 3 – 11). A face mask 26 includes a face plate 54 secured to hood at a plurality of fasteners 62, spaced at intervals along the perimeter of face mask 26 (Figures 3, 12, 13, 17, 21 and 22). Secured at each of these fastening locations to face mask 26 are [face] seal member (for example, 58 in Figures 4 – 11) and hood 24, consisting of inner and outer layers 50, 52. This provides the basic securing structure disclosed in Tischer et al.

Note that neither seal member 58 nor hood 24, 50, 52 are secured to face mask 26 at locations around the perimeter of face mask 26 that are intermediate to fasteners 62. Thus, the locations around the perimeter of face mask 26 that are intermediate to fasteners are not secured to either seal member 58 or hood 24. Consequently, face mask 26 is not sealed with either sealing member 58 or hood 24. Tischer et al is concerned with mechanically securing face mask 26 with sealing member 58 and hood 24 but does not provide a seal.

Independent claim 12 requires a facial lens having a perimeter sealing edge extending around the lens (see claim 12, line 5). Similarly, independent claim 21 requires a respirator mask having a facial lens and a perimeter sealing edge around the mask (see claim 21, line 5). Sealing is defined in the specification as “at least as effective to prevent contaminant intrusion into the interior of the respirator” (see page 5, line 32, to page 6, line 2). It is respectfully submitted that neither Tischer et al nor Corsini (nor Reeves et al with respect to claim 16) disclose, show or suggest such sealing as explicitly recited in the claims and as interpreted by the specification. It has been noted that Tischer et al discloses a firefighting hood and face mask assembly. The hood disclosed by Tischer et al is made of a knitted or woven heat and flame resistant aramid material (column 4, lines 3 – 11). A face mask 26 includes a face plate 54 secured to hood at a plurality of fasteners 62, spaced at intervals along the perimeter of face mask 26 (Figures 3, 12, 13, 17, 21 and 22). Secured at each of these fastening locations to face mask 26 are [face] seal member (for example, 58 in Figures 4 – 11) and hood 24,

consisting of inner and outer layers 50, 52. Even with element 60 (rim), Tischer et al does not provide such sealing. Note that the hood disclosed in Tischer et al only has to operate while coupled to a self-contained breathing apparatus (SCBA). The SCBA always provides a positive (with respect to ambient) pressure within the hood. Since the interior of the hood disclosed in Tischer et al always has a positive pressure, external contaminants can not enter the hood even though the face seal member does not provide a perimeter sealing edge as required by the present claims. In contrast, the presently claimed invention may be used in an environment in which the breathing of the operator induces a negative pressure (with respect to ambient) inside the respirator mask. Thus, the seal of presently claimed invention must be “at least as effective to prevent contaminant intrusion into the interior of the respirator.” This level of sealing is not taught nor suggested by Tischer et al.

With respect to the presently claimed invention, Corsini only discloses and has only been cited to show a gas delivery conduit. Corsini does not disclose the claimed features highlighted above.

With respect to the presently claimed invention, Reeves et al only discloses and has been cited only to show the use of microstructured surfaces. Reeves et al does not disclose the claimed features highlighted above.

Claims 13 – 20 are dependent upon independent claim 12 and contain all of the above noted limitations of claim 12. Similarly, claims 22 – 28 are dependent upon independent claim 21 and contain all of the above noted limitations of claim 21.

Thus, it is respectfully submitted that the Examiner has failed to establish a prima facie case of obviousness of claims 12 – 28 over Tischer et al in view of Corsini (and in view of Reeves et al with respect to claim 16). The rejection of claims 12 – 28 under 35 USC § 103(a) over Tischer et al in view of Corsini (and Reeves et al) is improper and should be withdrawn.



**3. Does Tischer et al disclose (a) a respiratory kit having a plurality of body seals of at least a first type and a second type; (b) a facial lens having a perimeter sealing edge extending around the lens; and (c) a facial lens interchangeable with and being selectively removably coupled with each body seal to render Claims 29 – 37 unpatentable under 35 USC § 103(a)?**

As noted above, Tischer et al discloses a firefighting hood and face mask assembly. The hood disclosed by Tischer et al is made of a knitted or woven heat and flame resistant aramid material (column 4, lines 3 – 11). A face mask 26 includes a face plate 54 secured to hood at a plurality of fasteners 62, spaced at intervals along the perimeter of face mask 26 (Figures 3, 12, 13, 17, 21 and 22). Secured at each of these fastening locations to face mask 26 are [face] seal member (for example, 58 in Figures 4 – 11) and hood 24, consisting of inner and outer layers 50, 52. This provides the basic securing structure disclosed in Tischer et al.

Note that neither seal member 58 nor hood 24, 50, 52 are secured to face mask 26 at locations around the perimeter of face mask 26 that are intermediate to fasteners 62. Thus, the locations around the perimeter of face mask 26 that are intermediate to fasteners are not secured to either seal member 58 or hood 24. Consequently, face mask 26 is not sealed with either sealing member 58 or hood 24. Tischer et al is concerned with mechanically securing face mask 26 with sealing member 58 and hood 24 but does not provide a seal.

Also note that the firefighting hood and face mask assembly disclosed in Tischer et al is a complete system. The system disclosed in Tischer et al always includes face mask 26 (or an equivalent), [face] sealing member 58 (or an equivalent) and hood 24 (or an equivalent). Thus, the system disclosed in Tischer et al always has a single configuration, although the exact structure of each element varies according to the various embodiments. At no point does Tischer et al show, disclose or suggest converting face mask 26 for use with different types of body seals nor a kit with interchangeable body seals. Both body seals disclosed in Tischer et al are shown used at all times.

First, independent claim 29 requires a respiratory kit having a plurality of body seals comprising at least a first type of body seal and a second type of body seal (see claim 29, lines 1 – 3). This is explicit language in the claims. It is respectfully submitted that neither Tischer

et al nor Corsini (nor Reeves et al with respect to claim 34), either singly or in combination, disclose, show or suggest such a conversion. In contrast, the firefighting hood and face mask assembly disclosed in Tischer et al shows at all times the face mask coupled to both a sealing member and a hood at the same time. Neither does Corsini disclose, show or suggest such a kit having a plurality of body seals of differing types.

Second, independent claim 29 also requires a facial lens ... having a perimeter sealing edge extending around the lens (see claim 29, lines 4 and 5) and further requires when so coupled, a seal is defined between the body seal and the lens (see claim 29, lines 7 and 8). Sealing is defined in the specification as “at least as effective to prevent contaminant intrusion into the interior of the respirator” (see page 5, line 32, to page 6, line 2). It is respectfully submitted that neither Tischer et al nor Corsini (nor Reeves et al with respect to claim 34) disclose, show or suggest such sealing as explicitly recited in the claims and as interpreted by the specification. It has been noted that Tischer et al discloses a firefighting hood and face mask assembly. The hood disclosed by Tischer et al is made of a knitted or woven heat and flame resistant aramid material (column 4, lines 3 – 11). A face mask 26 includes a face plate 54 secured to hood at a plurality of fasteners 62, spaced at intervals along the perimeter of face mask 26 (Figures 3, 12, 13, 17, 21 and 22). Secured at each of these fastening locations to face mask 26 are [face] seal member (for example, 58 in Figures 4 – 11) and hood 24, consisting of inner and outer layers 50, 52. Even with element 60 (rim), Tischer et al does not provide such sealing. Note that the hood disclosed in Tischer et al only has to operate while coupled to a self-contained breathing apparatus (SCBA). The SCBA always provides a positive (with respect to ambient) pressure within the hood. Since the interior of the hood disclosed in Tischer et al always has a positive pressure, external contaminants can not enter the hood even though the face seal member does not provide a perimeter sealing edge as required by the present claims. In contrast, the presently claimed invention may be used in an environment in which the breathing of the operator induces a negative pressure (with respect to ambient) inside the respirator mask. Thus, the seal of presently claimed invention must be “at least as effective to prevent contaminant intrusion into the interior of the respirator.” This level of sealing is not taught nor suggested by Tischer et al.

Third, independent claim 29 also requires at least one facial lens interchangeable with at least one of the plurality of body seals (see claim 29, line 4) with the lens capable of being selectively removably coupled with each body seal (see claim 29, lines 5 and 6). These are all explicit claim elements. It is respectfully submitted that neither Tischer et al nor Corsini (nor Reeves et al with respect to claim 34) disclose, show or suggest such explicitly claimed interchangeability and selective removability. Tischer et al does not show or suggest any interchanging. The hood respirator is Tischer et al has a single configuration.

With respect to the presently claimed invention, Corsini only discloses and has only been cited to show a gas delivery conduit. Corsini does not disclose the claimed features highlighted above.

With respect to the presently claimed invention, Reeves et al only discloses and has been cited only to show the use of microstructured surfaces. Reeves et al does not disclose the claimed features highlighted above.

Claims 30 – 37 are dependent upon independent claim 29 and contain all of the above noted limitations of claim 29.

Thus, it is respectfully submitted that the Examiner has failed to establish a prima facie case of obviousness of claims 29 – 37 over Tischer et al in view of Corsini (and in view of Reeves with respect to claim 34). The rejection of claims 29 – 37 under 35 USC § 103(a) over Tischer et al in view of Corsini (and Reeves) is improper and should be reversed.

- 4. Does Tischer et al disclose (a) a respirator mask interchangeable with at least one respirator hood; (b) a facial lens with a perimeter sealing edge around the mask; and (c) a mask capable of being selectively removably coupled with each hood along the perimeter sealing edge of the mask to render Claims 38 – 41 unpatentable under 35 USC § 103(a)?**

As noted above, Tischer et al discloses a firefighting hood and face mask assembly. The hood disclosed by Tischer et al is made of a knitted or woven heat and flame resistant aramid material (column 4, lines 3 – 11). A face mask 26 includes a face plate 54 secured to hood at a plurality of fasteners 62, spaced at intervals along the perimeter of face mask 26 (Figures 3, 12, 13, 17, 21 and 22). Secured at each of these fastening locations to face mask 26 are [face] seal member (for example, 58 in Figures 4 – 11) and hood 24, consisting of inner and outer layers 50, 52. This provides the basic securing structure disclosed in Tischer et al.

Note that neither seal member 58 nor hood 24, 50, 52 are secured to face mask 26 at locations around the perimeter of face mask 26 that are intermediate to fasteners 62. Thus, the locations around the perimeter of face mask 26 that are intermediate to fasteners are not secured to either seal member 58 or hood 24. Consequently, face mask 26 is not sealed with either sealing member 58 or hood 24. Tischer et al is concerned with mechanically securing face mask 26 with sealing member 58 and hood 24 but does not provide a seal.

Also note that the firefighting hood and face mask assembly disclosed in Tischer et al is a complete system. The system disclosed in Tischer et al always includes face mask 26 (or an equivalent), [face] sealing member 58 (or an equivalent) and hood 24 (or an equivalent). Thus, the system disclosed in Tischer et al always has a single configuration, although the exact structure of each element varies according to the various embodiments. At no point does Tischer et al show, disclose or suggest converting face mask 26 for use with different types of body seals nor a kit with interchangeable body seals. Both body seals disclosed in Tischer et al are shown used at all times.

First, independent claim 38 requires at least one respirator mask, interchangeable with at least one ... respirator hood (see claim 38, lines 3 and 4). This is an explicit claim element. It is respectfully submitted that neither Tischer et al nor Corsini (nor Motsinger with respect

to claim 40) disclose, show or suggest such explicitly claimed interchangeability. Tischer et al does not show or suggest any interchanging. The hood respirator is Tischer et al has a single configuration.

Second, independent claim 38 also requires a facial lens ... and a perimeter sealing edge around the mask (see claim 38, lines 4 and 5) and further requires when so coupled, ... a seal is defined between the hood and the mask (see claim 29, lines 7 and 8). Sealing is defined in the specification as “at least as effective to prevent contaminant intrusion into the interior of the respirator” (see page 5, line 32, to page 6, line 2). It is respectfully submitted that neither Tischer et al nor Corsini (nor Motsinger with respect to claim 40) disclose, show or suggest such sealing as explicitly recited in the claims and as interpreted by the specification. It has been noted that Tischer et al discloses a firefighting hood and face mask assembly. The hood disclosed by Tischer et al is made of a knitted or woven heat and flame resistant aramid material (column 4, lines 3 – 11). A face mask 26 includes a face plate 54 secured to hood at a plurality of fasteners 62, spaced at intervals along the perimeter of face mask 26 (Figures 3, 12, 13, 17, 21 and 22). Secured at each of these fastening locations to face mask 26 are [face] seal member (for example, 58 in Figures 4 – 11) and hood 24, consisting of inner and outer layers 50, 52. Even with element 60 (rim), Tischer et al does not provide such sealing. Note that the hood disclosed in Tischer et al only has to operate while coupled to a self-contained breathing apparatus (SCBA). The SCBA always provides a positive (with respect to ambient) pressure within the hood. Since the interior of the hood disclosed in Tischer et al always has a positive pressure, external contaminants can not enter the hood even though the face seal member does not provide a perimeter sealing edge as required by the present claims. In contrast, the presently claimed invention may be used in an environment in which the breathing of the operator induces a negative pressure (with respect to ambient) inside the respirator mask. Thus, the seal of presently claimed invention must be “at least as effective to prevent contaminant intrusion into the interior of the respirator.” This level of sealing is not taught nor suggested by Tischer et al.

Third, independent claim 38 also requires the mask is capable of being selectively removably coupled with each hood along the perimeter sealing edge of the mask and the mask opening (see claim 38, lines 5 and 6). These are explicit claim elements. It is respectfully

submitted that neither Tischer et al nor Corsini (nor Reeves with respect to claim 34) disclose, show or suggest such explicitly claimed selective removability. Tischer et al does not show or suggest any selective removability and subsequent coupling. The hood respirator is Tischer et al has a single configuration.

With respect to the presently claimed invention, Corsini only discloses and has only been cited to show a gas delivery conduit. Corsini does not disclose the claimed features highlighted above.

With respect to the presently claimed invention, Motsinger only discloses and has been cited only to show the use of a full body suit. Reeves et al does not disclose the claimed features highlighted above.

Claims 39 – 41 are dependent upon independent claim 38 and contain all of the above noted limitations of claim 38.

Thus, it is respectfully submitted that the Examiner has failed to establish a prima facie case of obviousness of claims 38 – 41 over Tischer et al in view of Corsini (and in view of Motsinger with respect to claim 40). The rejection of claims 38 – 41 under 35 USC § 103(a) over Tischer et al in view of Corsini (and Motsinger) is improper and should be reversed.

## CONCLUSION

It is respectfully submitted that the Examiner is applying hindsight reconstruction of the claimed inventions and is not giving proper weight to the explicit language contained in the claims.

All of the rejections should be reversed.

Respectfully submitted on behalf of  
3M Innovative Properties Company



April 5, 2004

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## APPENDIX

### CLAIMS ON APPEAL

1. A method of converting a respirator mask from a first type of body seal to a second type of body seal, wherein the respirator mask has a facial lens, the lens having a perimeter sealing edge extending around the lens, the method comprising:  
  
releasing a seal between the perimeter sealing edge of the lens and a lens opening on the first type of body seal;  
  
removing the lens from the lens opening on the first type of body seal;  
  
aligning the lens within a lens opening on the second type of body seal; and  
  
forming a seal between the perimeter sealing edge of the lens and the lens opening of the second type of body seal.
2. The method of claim 1 wherein the first type of body seal is selected from the group consisting of a full facepiece seal, a respirator hood, and a full body respirator suit.
3. The method of claim 2 wherein the second type of body seal is selected from the group consisting of a full facepiece seal, a respirator hood, and a full body respirator suit.



4. The method of claim 1 wherein the respirator mask has a clamp element for urging opposed rim portions of the perimeter sealing edge of the lens and the lens opening of the first type of body seal together, and wherein the releasing step comprises:  
  
loosening the clamp element.
5. The method of claim 4 wherein the loosening step comprises:  
  
separating opposed threaded fasteners of the clamp element.
6. The method of claim 4 wherein the loosening step comprises:  
  
elastically disengaging the clamp element from the respirator mask.
7. The method of claim 4 wherein the loosening step comprises:  
  
releasing a latch mechanism of the clamp element.
8. The method of claim 4 wherein the loosening step requires no tools.
9. The method of claim 4 wherein one or both of the opposed rim portions include microstructured sealing surfaces.
10. The method of claim 4 wherein the opposed rim portions include cooperative mechanical engagement surfaces.
11. A method for converting a respirator mask from a full facepiece respirator to a hood respirator, wherein the respirator mask has a facial lens, the lens having a perimeter sealing edge extending around the lens, the method comprising:

releasing a seal on the full facepiece respirator from sealed engagement to the facial lens of the mask about the perimeter sealing edge thereof;

removing the lens from the full facepiece respirator;

aligning a lens opening of a hood respirator in sealed engagement with the perimeter sealing edge of the mask; and

sealably affixing the lens opening of the hood respirator to the perimeter sealing edge of the mask.

12. A hood respirator comprising:

a shroud having a head-covering portion which has a lens opening therein, and a body sealing portion configured for forming a seal with a wearer's neck, shoulders or other body surfaces;

a facial lens having a perimeter sealing edge extending around the lens;

a disengageable coupling between the lens opening of the shroud and the perimeter sealing edge of the lens, the coupling having a first engaged condition wherein the lens is sealably affixed to the shroud and a second released condition wherein the lens is removable from the shroud; and

a breathable gas delivery conduit fluidly coupled to the hood.

13. The hood respirator of claim 12 wherein the perimeter sealing edge is an integral, peripheral edge of the lens.

14. The hood respirator of claim 12 and further comprising:

a lens frame disposed around the facial lens, wherein the perimeter sealing edge is a peripheral edge of the lens frame.

15. The hood respirator of claim 12 wherein the perimeter sealing edge of said facial lens and the lens opening have opposed rim portions and wherein the disengageable coupling is selected from the group consisting of opposed threaded members, an elastic band at least partially extending along the opposed rim portions, and a latch mechanism.
16. The hood respirator of claim 12 wherein the perimeter sealing edge of said facial lens and the lens opening have opposed rim portions and wherein one or both of the opposed rim portions include microstructured sealing surfaces.
17. The hood respirator of claim 12 wherein the perimeter sealing edge of said facial lens and the lens opening have opposed rim portions and wherein the opposed rim portions include cooperative mechanical engagement surfaces.
18. The hood respirator of claim 12, and further comprising:  
  
a full facepiece seal connected to the lens wherein the shroud is superpositioned over the full facepiece seal through the disengageable coupling between the lens opening of the shroud and the perimeter sealing edge extending around the lens.
19. The hood respirator of claim 12 wherein the breathable gas delivery conduit communicates fluidly with the hood through the shroud.
20. The hood respirator of claim 12 wherein the breathable gas delivery conduit communicates fluidly with the hood through the lens.

21. A hood respirator comprising:

a shroud having a head-covering portion having a front opening therein, and a body sealing portion configured for forming a substantially seal with a wearer's neck, shoulders or other body surfaces;

a respirator mask having a facial lens, a perimeter sealing edge around the mask, and a breathable gas delivery conduit; and

a disengageable coupling between the front opening of the shroud and the perimeter sealing edge of mask, the coupling having a first engaged condition wherein the mask is sealably affixed to the shroud and a second released condition wherein the mask is removable from the shroud.

22. The hood respirator of claim 21 wherein the breathable gas delivery conduit is connected to the mask through the lens.

23. The hood respirator of claim 21 wherein the respirator mask has a full facepiece seal, and wherein the shroud is superpositioned over the full facepiece seal through the disengageable coupling between the mask opening of the shroud and the perimeter sealing edge around the mask.

24. The hood respirator of claim 23 wherein the full facepiece seal is detachable from the respirator mask.

25. The hood respirator of claim 21, and further comprising:

a harness attached to the respirator mask, with the harness being adapted for securing the respirator mask over a human face.

26. The hood respirator of claim 21 wherein the respirator mask has a nose cup.

27. The hood respirator of claim 26 wherein the nose cup is detachable from the respirator mask.

28. The hood respirator of claim 26, and further comprising:

a fastener attached to the hood, with the fastener being suitable for securing the nose cup over a human nose or mouth and capable of being tightened or loosened from the outside of the hood.

29. A respiratory kit comprising:

a plurality of body seals comprising at least a first type of body seal and a second type of body seal, each body seal having a lens opening defined therein;

at least one facial lens, interchangeable with at least one of the plurality of body seals, having a perimeter sealing edge around the lens, the lens capable of being selectively removably coupled with each body seal along the perimeter sealing edge of the lens and the lens opening on the body seal wherein, when so coupled, a seal is defined between the body seal and the lens; and

a breathable gas delivery conduit capable of being fluidly coupled to each of the body seals or the lens.

30. The respiratory kit of claim 29 wherein each of the first and the second types of body seals is selected from the group consisting of a full facepiece seal, a respirator hood, and a full body respirator suit.
31. The respiratory kit of claim 29 wherein the first type of body seal is a full facepiece seal capable of forming a seal with a human face.
32. The respiratory kit of claim 31 wherein the second type of body seal is selected from the group consisting of a respirator hood and a full body respirator suit.
33. The respiratory kit of claim 29 and further comprising:  
  
a coupling adapted to urge opposed rim portions of the perimeter sealing edge on the lens and the lens opening together.
34. The respiratory kit of claim 33 wherein one or both of the opposed rim portions include microstructured sealing surfaces.
35. The respiratory kit of claim 33 wherein the opposed rim portions include cooperative mechanical engagement surfaces.
36. The respiratory kit of claim 29 wherein the breathable gas delivery conduit is configured for communicating fluidly with each type of body seal through a portion thereof.
37. The respiratory kit of claim 29 wherein the breathable gas delivery conduit is configured for communicating fluidly with the lens.

38. A respiratory kit comprising:

at least one respirator hood, with each hood having a mask opening defined therein;

at least one respirator mask, interchangeable with at least one of the at least one respirator hood, having a facial lens, a full facepiece seal coupled with the lens, and a perimeter sealing edge around the mask, wherein the mask is capable of being selectively removably coupled with each hood along the perimeter sealing edge of the mask and the mask opening on the hood wherein, when so coupled, the hood is superpositioned over the full facepiece seal and a seal is defined between the hood and the mask; and

a breathable gas delivery conduit capable of being fluidly coupled to the mask or the hood.

39. The respiratory kit of claim 38 wherein the full facepiece seal is removable from the mask.

40. The respiratory kit of claim 38 wherein the hood is a full body respirator suit.

41. The respiratory kit of claim 38 wherein the breathable gas delivery conduit is configured for fluidly communicating with the mask through the lens.